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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/662,320

09/16/2003

Hitoshi Shindo

461-146

9259

23117

7590

06/09/2004

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EXAMINER

MAYES, MELVIN C

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/662,320

Applicant(s)

SHINDO ET AL.

Examiner

Melvin Curtis Mayes

Art Unit

1734

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-30 and 58-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-29 and 58-61 is/are rejected.
- 7) ☒ Claim(s) 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
- 2) ☒ Certified copies of the priority documents have been received in Application No. 10/028,992.
- 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/16/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102 and 103*

(1)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(2)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(3)

Claims 11-15 and 18-29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 3-48415.

JP 3-48415 discloses a method of making a laminated ceramic capacitor comprising: forming green sheets of a mixture of  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ ,  $\text{PbTiO}_3$  and  $\text{Pb}(\text{Ni}_{1/2}\text{W}_{1/2})\text{O}_3$  which when sintered forms a lead composite perovskite compound; applying an inner electrode paste to the green sheets; laminating the green sheets; heat treating to remove binder; heat treating in hydrogen to reduce the inner electrodes; and sintering the dielectric and electrode in nitrogen. The inner electrode paste comprises CuO powder and 0.5-10 wt% of one or more types selected from MgO,  $\text{Nb}_2\text{O}_5$ ,  $\text{Ta}_2\text{O}_5$ , NiO,  $\text{TiO}_2$ ,  $\text{WO}_3$ , CaO and ZnO. In some embodiments, the electrode paste comprises 2-5 wt% MgO and 1-2 wt% CaO (Abstract, Table 1 and Table 2).

Further, by reducing the inner electrodes of CuO by heat treating in hydrogen before sintering the dielectric and electrode, the laminate containing electrically conductive base material (Cu) having a greater standard Gibbs free energy than the ceramic material is obviously prepared immediately before the step of integrally baking (sintering), as claimed in Claims 9-11.

Further, by providing 1-2 wt% CaO in an electrode paste of CuO, the electrode paste obviously comprises a melting restrictive material (CaO) for restricting melting of the CuO electrically conductive base metal material, as claimed in Claims 9 and 12.

Further, by providing 2-5 wt% MgO in an electrode paste of CuO, the electrode paste obviously comprises a melting point raising material (MgO) for raising the melting point of the CuO, as claimed in Claims 10 and 13.

Further, by providing 2-5 wt % MgO and 1-2 wt% CaO in an electrode paste of CuO, the electrode paste obviously comprises a melting point raising material (MgO) for raising the melting point of the CuO and a diffusion restrictive material (CaO) for restricting diffusion of the CuO into the green sheet, as claimed in Claims 11 and 14.

(4)

Claims 58-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '415 as applied to claim 9 above, and further in view of Mori et al. 4,977,485 .

Mori et al. teach that in a monolithic ceramic capacitor of dielectric ceramic and internal electrodes of copper, there can be used copper containing the dielectric ceramic powder as an additive added in 0.05 to 40% by weight to obtain a capacitor having high dielectric constant wherein migration in the internal electrode is prevented at low cost (col. 3, lines 2-11).

It would have been obvious to one of ordinary skill in the art to have modified the method of JP '415 for making a laminated ceramic capacitor of copper inner electrodes and dielectric by also including in the inner electrode paste, the dielectric ceramic used to make the green sheets, as taught by Mori et al., as additive added to the inner electrodes to obtain a capacitor having high dielectric constant wherein migration in the internal electrode is prevented at low cost. Providing the dielectric ceramic in amount less than 25 wt% or less than 15 wt% would have been obvious to one of ordinary skill in the art, as Mori et al. teach that the dielectric additive can be added in the range of 0.05 to 40 wt%.

(5)

Claims 9, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Randall et al. 2002/0079622.

Randall et al. disclose a method of making a multilayer piezoelectric device comprising: providing a layer of piezoelectric ceramic material such as PZT; applying to the layer an electrode of copper base metal powder coated with an inorganic coating such as  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  or  $\text{B}_2\text{O}_3$ ; laminating layers, heating to remove organic materials; and co-sintering the piezoelectric and the copper electrodes [0020]-[0030].

By providing the copper base metal powder with an inorganic coating of  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  or  $\text{B}_2\text{O}_3$ , the electrode layer of the laminate to be co-sintered obviously contains electrically conductive base material (copper) having a greater standard Gibbs free energy than the ceramic material and a melting restrictive material ( $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  or  $\text{B}_2\text{O}_3$ ), as claimed in Claim 9.

***Allowable Subject Matter***

(6)

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

(7)


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(8)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
June 3, 2004